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EXAMINER	
LE, MIRANDA	
ART UNIT	**PAPER NUMBER**
2167	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,943	MASAYA MORI	
	Examiner	Art Unit	
	Miranda Le	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment, filed 11/07/2006.

2. Claims 1-18 are pending in this application. This action is made Final.

The objection to the specification of the invention has been withdrawn in view of the amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6, 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kagawa et al. (US Patent No 6,910,118), in view of Gooch et al. (US Pub. No. 20030174710).

As per claim 1, Kagawa teaches a fixed length data search device, comprising:

a hash operation means for operating and outputting a hash value (i.e. an 8-bit address is calculated by the above-described hash function, col. 4, line 65 to col. 5, line 11) of an inputted fixed length datum (i.e. an input 48-bit MAC address, col. 3, lines 24-32);

a data table memory consisting of N numbers of memory banks (i.e. memory space 301 of the banks B1-B4, Fig. 4, col. 4, lines 35-41), where N is an integer greater than or equal to 2 (i.e. N is larger than 4, col. 5, lines 17-22), the data table memory capable of storing a data table holding a large number of fixed length data (i.e. MAC addresses, col. 4, lines 35-41);

a comparison means (i.e. comparators, col. 4, line 65 to col. 5, line 11) for simultaneously comparing (i.e. simultaneously compared, col. 4, lines 61-64) a plurality of fixed length data stored at the same memory address (i.e. memory space 301 of the banks B1-B4, Fig. 4, col. 4, lines 35-41) in said N numbers of memory banks, the comparison means for outputting results of the comparison (i.e. the respective comparators C1-C4 compare the read-out registered MAC addresses to the destination MAC address, and respective comparison results (match or mismatch) are output to the OR circuit, col. 4, line 65 to col. 5, line 11).

Kagawa does not expressly teach a pointer table memory for storing a memory pointer table having a memory address at which each fixed length datum is stored with said hash value as an index.

However, Gooch teaches a pointer table memory for storing a memory pointer table having a memory address at which each fixed length datum is stored with said hash

value as an index (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

It would have been obvious to one of ordinary skill of the art having the teaching of Kagawa and Gooch at the time the invention was made to modify the system of Mathews to include a pointer table memory for storing a memory pointer table having a memory address at which each fixed length datum is stored with said hash value as an index as taught by Gooch. One of ordinary skill in the art would be motivated to make this combination in order to reduce the number of conflicts/collisions which occur in view of Gooch, as doing so would give the added benefit of providing a method and system that can be efficiently implemented in high-speed hardware as taught by Gooch ([0035]).

As per claim 14, Kagawa teaches a method of searching fixed length data (i.e. Searching Process, col. 4, lines 61-64) comprising the steps of:

performing hash operation said hash operation outputting a hash value (i.e. an 8-bit address is calculated by the above-described hash function, col. 4, line 65 to col. 5, line 11) of inputted fixed length data (i.e. an input 48-bit MAC address, col. 3, lines 24-32);

reading N numbers of fixed length data (i.e. MAC addresses, col. 4, lines 35-41) stored at an address from a data table stored in a data table memory consisting of N numbers of memory banks (i.e. memory space 301 of the banks B1-B4, Fig. 4, col. 4, lines 35-41), where N is an integer that is greater than or equal to 2 (i.e. N is larger than

4, col. 5, lines 17-22), the data table capable of storing a large number of fixed length data (i.e. MAC addresses, col. 4, lines 35-41); and

simultaneously comparing (i.e. simultaneously compared, col. 4, lines 61-64) said read N numbers of fixed length data with said inputted single fixed length datum, and outputting results of the comparison (i.e. the respective comparators C1-C4 compare the read-out registered MAC addresses to the destination MAC address, and respective comparison results (match or mismatch) are output to the OR circuit, col. 4, line 65 to col. 5, line 11) (col. 4, lines 61-64).

Kagawa does not expressly teach referring to a memory pointer table holding a memory address at which each fixed length datum is stored with said hash value as an index; and an address pointed to by a pointer in said memory pointer table.

However, Gooch teaches referring to a memory pointer table holding a memory address at which each fixed length datum is stored with said hash value as an index; and an address pointed to by a pointer in said memory pointer table (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

It would have been obvious to one of ordinary skill of the art having the teaching of Kagawa and Gooch at the time the invention was made to modify the system of Mathews to include referring to a memory pointer table holding a memory address at which each fixed length datum is stored with said hash value as an index; and an address pointed to by a pointer in said memory pointer table as taught by Gooch. One of ordinary skill in the art would be motivated to make this combination in order to reduce the number of conflicts/collisions which occur in view of Gooch, as doing so would give the

added benefit of providing a method and system that can be efficiently implemented in high-speed hardware as taught by Gooch ([0035]).

As per claim 2, Kagawa teaches the fixed length data search device according to claim 1, wherein said comparison means comprises N numbers of comparators (i.e. comparators C1, C2, C3, C4, Fig. 2) for determining if two fixed length data are identical (i.e. match or mismatch, col. 4, line 65 to col. 5, line 11), said comparison means determining if any of the fixed length data stored at the same memory address in said N numbers of memory banks matches the single fixed length datum inputted to said hash operation means, said comparison means outputting the result of the determination (col. 4, lines 6-15).

Gooch teaches the device referring to said memory pointer table based on a resulting memory address (i.e. each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

As per claim 3, Kagawa teaches the fixed length data search device according to claim 1, wherein an datum identical to the single fixed length datum inputted to said hash operation means is searched in said data table through said hash operation means, said single fixed length datum registered in said data table if the datum has not been previously registered with said data table (i.e. The determiner may determine that the input data has been registered in the tables when a match-indicating comparison result is received from at least one of the comparators, and determines that the input data is not registered in the tables when a mismatch-indicating comparison result is received from each of the comparators (col. 2, lines 13-21).

As per claim 4, Kagawa teaches the fixed length data search device according to claim 3, wherein each of a plurality of fixed length data having the same hash value are stored at the same memory address (i.e. memory space 301, Fig. 4) of a different memory bank in said data table memory (i.e. four different MAC addresses can be registered for the same hash output, col. 4, lines 42-54).

As per claim 5, Gooch teaches the fixed length data search device according to claim 3, wherein each of a plurality of fixed length data having a different hash value are stored at the same memory address of a different memory bank in said data table memory (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

As per claim 6, Kagawa teaches the fixed length data search device according to claim 1, wherein said fixed length data is a MAC (Media Access Control) address for network communications, and said data table memory is a MAC entry table memory for storing a MAC address table holding a large number of MAC addresses (i.e. MAC addresses, col. 4, lines 35-41).

As per claim 15, Kagawa teaches the method of searching fixed length data according to claim 14, wherein said step of comparing comprises simultaneously comparing said read N numbers of fixed length data using parallel processing, said comparing determining if two fixed length data are identical (i.e. the four registered

MAC addresses are simultaneously read out and are simultaneously compared to the source MAC addresses by the four comparators C1-C4 (col. 4, lines 61-64).

As per claim 16, Kagawa teaches the method of searching fixed length data according to claim 15, wherein said comparing comprises the steps of: searching an identical datum to said inputted single fixed length datum in said data table based on its hash value, and registering said inputted single fixed length datum in said data table if said identical datum has not been detected in said step of searching (i.e. When receiving the registered MAC addresses from the banks B1-B4, the respective comparators C1-C4 compare the registered MAC addresses to the source MAC address and output comparison results (match or mismatch) to the OR circuit 103, col. 4, lines 6-15).

As per claim 17, Kagawa teaches the method of searching fixed length data according to claim 16, wherein each of separate fixed length data having the same hash value is registered with the same memory address of a different memory bank in said data table memory during said registering (i.e. memory space 301, Fig. 4) of a different memory bank in said data table memory (i.e. four different MAC addresses can be registered for the same hash output, col. 4, lines 42-54).

As per claim 18, Gooch teaches the method of searching fixed length data according to claim 17, wherein each of a plurality of fixed length data having a different hash value is registered with the same memory address of a different memory bank in said data table memory (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

5. Claims 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gooch et al. (US Pub. No. 20030174710), in view of Kagawa et al. (US Patent No 6,910,118).

As per claim 7, Gooch teaches a fixed length data search device, comprising:

a hash operation means, said hash operation means using two types of hash functions to determine a first and second hash values of an inputted fixed length datum (i.e. performing parallel hash transformations on the MAC SA/DA addresses and on the IP source and destination addresses received from the various connected clients. The hash transformations are used to generate a hash pointer for each address input, [0041]);

a pointer table memory for storing a first memory pointer table, said pointer table memory having a memory address at which each fixed length datum is stored (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]), wherein said first hash value is an index, and a second memory pointer table holding the memory address at which each fixed length datum is stored, said second hash value as an index (i.e. performing parallel hash transformations on the MAC SA/DA addresses and on the IP source and destination addresses received from the various connected clients. The hash transformations are used to generate a hash pointer for each address input, [0041]).

Gooch does not expressly teach a data table memory consisting of N numbers of memory banks, where N is an integer that is greater than or equal to 2, the data table memory for storing a data table holding a large number of fixed length data.; and a comparison means for simultaneously comparing a plurality of fixed length data stored at

the same memory address in said N numbers of memory banks, the comparison means for outputting results of the comparison.

However, Kagawa teaches a data table memory consisting of N numbers of memory banks (i.e. memory space 301 of the banks B1-B4, Fig. 4, col. 4, lines 35-41), where N is an integer that is greater than or equal to 2 (i.e. N is larger than 4, col. 5, lines 17-22), the data table memory for storing a data table holding a large number of fixed length data (i.e. MAC addresses, col. 4, lines 35-41).

a comparison means (i.e. comparators, col. 4, line 65 to col. 5, line 11) for simultaneously comparing (i.e. simultaneously compared, col. 4, lines 61-64) a plurality of fixed length data stored at the same memory address (i.e. the accessed memory areas, col. 4, line 65 to col. 5, line 11) in said N numbers of memory banks, the comparison means for outputting results of the comparison (i.e. the respective comparators C1-C4 compare the read-out registered MAC addresses to the destination MAC address, and respective comparison results (match or mismatch) are output to the OR circuit, col. 4, line 65 to col. 5, line 11).

It would have been obvious to one of ordinary skill of the art having the teaching of Gooch and Kagawa at the time the invention was made to modify the system of Mathews to include a data table memory consisting of N numbers of memory banks, where N is an integer that is greater than or equal to 2, the data table memory for storing a data table holding a large number of fixed length data.; and a comparison means for simultaneously comparing a plurality of fixed length data stored at the same memory address in said N numbers of memory banks, the comparison means for outputting results of the comparison as taught by Kagawa. One of ordinary skill in the art would be

motivated to make this combination in order to determine that the input source MAC address has been already registered in the entry table 102 and therefore does not perform a registration/learning process in view of Kagawa, as doing so would give the added benefit of allowing efficient hash search with suppressing the possibility of occurrence of rehashing as taught by Kagawa (col. 1, lines 53-56).

As per claim 8, Gooch teaches the fixed length data search device according to claim 7, further comprising a pointer selector table using said first hash value as an index to indicate which one of said first and second memory pointer tables should be referred to when a fixed length datum is inputted (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

As per claim 9, Kagawa teaches the fixed length data search device according to claim 8, wherein when the number of stored data of separate fixed length data having the same first hash value exceeds N (i.e. The rehashing occurs only when another source MAC address Ae produces the same hash output indicating the memory space 301 having no memory space left. In the present embodiment, since up to four MAC addresses can reliably be registered, the frequency of occurrence of rehashing can be significantly reduced (col. 4, lines 55-60).

Gooch teaches a pointer in said pointer selector table corresponding to the first hash value of an unstored fixed length datum stored is set to said second memory pointer table, said memory address at which the datum is stored managed with said second

memory pointer table (i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).

As per claim 10, Kagawa teaches the fixed length data search device according to claim 9, wherein said comparison means comprises N numbers of comparators, said comparators simultaneously compare all bits to determine whether or not two fixed length data are identical (i.e. each entry is composed of a 48-bit MAC address, col. 3, lines 13-23).

As per claim 11, Kagawa teaches the fixed length data search device according to claim 9, wherein said comparison means determines if any of the fixed length data stored at the same memory address in said N numbers of memory banks (i.e. memory space 301 of the banks B1-B4, Fig. 4, col. 4, lines 35-41) matches the single fixed length datum inputted to said hash operation means and outputs the result of the determination (i.e. The determiner may determine that the input data has been registered in the tables when a match-indicating comparison result is received from at least one of the comparators, and determines that the input data is not registered in the tables when a mismatch-indicating comparison result is received from each of the comparators (col. 2, lines 13-21).

As per claim 12, Kagawa teaches the fixed length data search device according to claim 9, wherein if another fixed length datum having the same first hash value as an inputted fixed length datum has not been registered with said data table, said inputted fixed length datum is stored in said data table memory, and said memory address at

which the datum is stored is managed with said main memory pointer table (i.e. The determiner may determine that the input data has been registered in the tables when a match-indicating comparison result is received from at least one of the comparators, and determines that the input data is not registered in the tables when a mismatch-indicating comparison result is received from each of the comparators (col. 2, lines 13-21).

As per claim 13, Gooch teaches the fixed length data search device according to claim 7, wherein said fixed length data is a MAC (Media Access Control) address for network communications, and said data table memory is a MAC entry table memory for storing a MAC address table holding a large number of MAC addresses (i.e. MAC SA/DA addresses [0041]).

Response to Arguments

7. Applicant's arguments filed 11/07/2006 have been fully considered but they are not persuasive.

Applicant argues that Gooch's reference does not teach/suggest using a pointer table memory.

The Examiner respectfully disagrees for the following reasons:

As detailed in the office action:

Gooch teaches a pointer table memory for storing a memory pointer table having a memory address at which each fixed length datum is stored with said hash value as an index *(i.e. Each hashing pointer references a block of memory containing one or multiple IP entries, [0040]).*

a pointer table memory = *a block of memory*

a memory address = *hashing pointer*

each fixed length datum = *IP address or MAC addresses ([0037])*

index = *IP entries*

It should be noted that Gooch teaches that, ([0042]), MAC addresses is 48-bit MAC destination address (i.e. fixed length). One skilled in the art would understand that a pointer is a memory address.

As shown in Fig. 1 and paragraph [0040], Gooch teaches using a pointer table memory as *"router 120 functions by examining the packets coming from client 101 to determine the routing port for transmitting packets to and from client 101. In determining the routing port, the router 120 will perform a* ***destination*** *address (DA) lookup to forward the packet, and may also perform a* ***source*** *address (SA) lookup to learn or authenticate the sending client, in this case client 101. In accordance with embodiments of the present invention, router 120 will use the* ***destination*** *IP address to generate a hashing pointer and use this hashing pointer to reference its internal hashing table. Each hashing pointer references a block of memory containing one or multiple IP entries (e.g.,* ***addresses****). The entries are configured to map to the ports of the router 120 and are used by the router 120 to determine which port to forward the packet through.*

Accordingly, the claimed invention as represented in the claims does not represent a patentable over the art of record.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham, can be reached on (571) 272-7079. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Miranda Le
December 27, 2006

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